



Glass Fusion

Eric Markow and Thom Norris test the limits of science and art with their one-of-a-kind woven glass sculptures

By Judith Bell

Photography by Javier Agostinelli

Self-taught glass artists Eric Markow and Thom Norris set out to do the seemingly impossible—to weave glass into a fabric from which they would create sculptural art objects. What followed was a four-year journey of trial and error and pioneering experimentation that redefined both the potential color palette and forms possible with their chosen medium of fused glass. The result is a collection of table and wall sculptures that marry science, art and alchemy.

Eric, trained as a chemical engineer, and Thom, who majored in biology, began working together in the early 1990s creating stained glass windows inspired by organic forms. They traveled

Eric Markow (pictured, left) selects strips of colored glass for a new piece while Thom Norris (pictured, right) polishes the edges of a woven glass sculpture in their Falls Church studio. Their work ranges from the six-inch *amber babies* woven glass nest (top) to large table sculptures such as *Confetti* (below), which measures 19 inches in diameter.

extensively, stimulated by such destinations as the Grand Canyon, Maui and the Southwest. They collected unusual glass throughout the world to incorporate into their projects.

“We would go in glass shops in Vancouver, for example,” says Norris, “and ask to see glass in the back that might be thought too odd or expensive for the showroom or that they weren’t considering selling. Invariably, we would come away with something old or incredibly unique that no one else was working with that also gave us an expanded color range.”

Markow and Norris quickly built a reputation for creating stained-glass windows that departed from traditional expressions in glass. Their ongoing search for interesting glass and the desire to push the available color palette led them four years ago to fused glass and the idea of making their own glass.

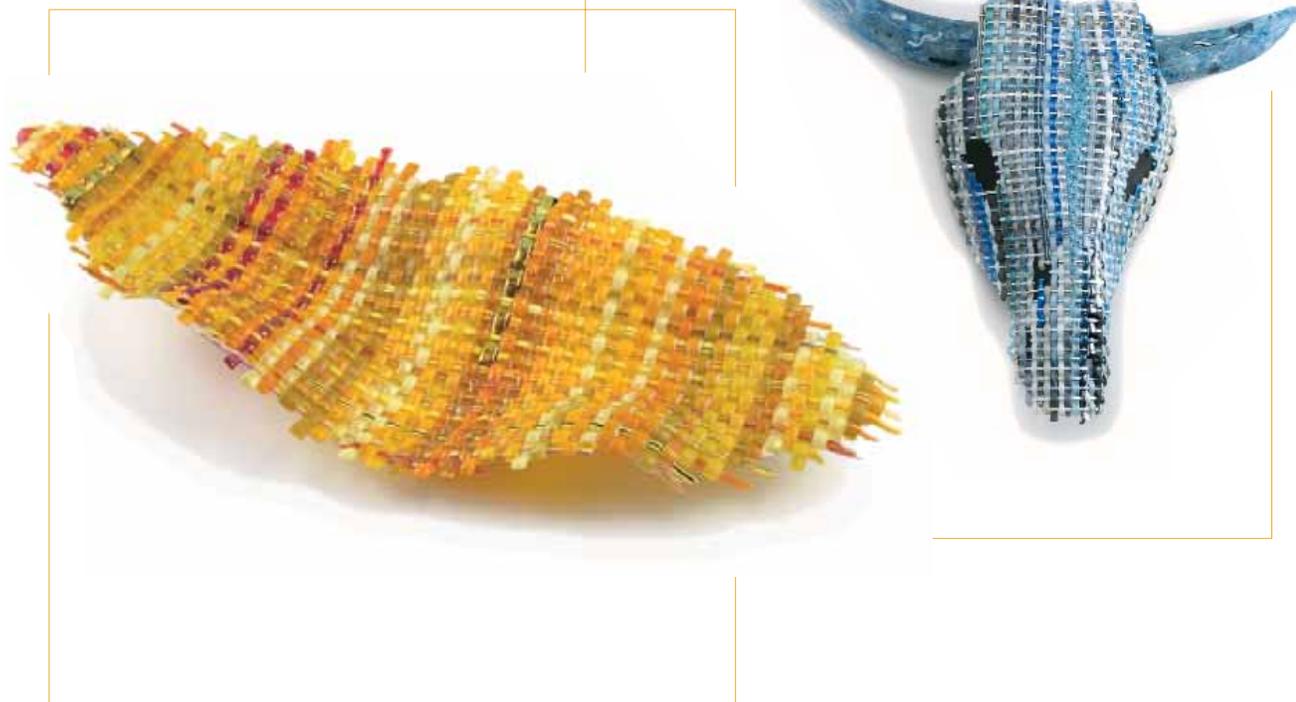
Fused glass is warm glass heated in a kiln to mid-zone temperatures that allow the material to be shaped and formed. They found they could add glass powders to existing sheets of raw glass or layer two sheets of different colors together to create a new hue. What had begun as a

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Markow and Norris spent years experimenting and perfecting the process of fusing glass into colorful woven pieces that seem to defy the laws of science and physics, including (clockwise from bottom) table sculptures entitled *Land and Sea by Fire* and *Solar Petal* and wall sculptures like *Babe*. In the studio, Eric Markow scores strips of glass with a glass cutter (right).

search for supplementing interesting glass for their stained-glass projects quickly revealed itself as a means for taking control over the glass in unprecedented ways. Here was the medium that would allow them to shift their creativity to an arena where they could pro-



duce glass that would be appreciated for its artistic merit and would showcase the energy involved in creating it.

Already seduced by color in glass, the concept of weaving glass grew out of the partners' desire to inject texture into their pieces. In their early attempts at the technique they cut small strips of glass, fused them together, cutting them into squares that were rotated to resemble a checkerboard. After fusing, the pieces appeared at a distance to be woven, but closer inspection revealed that the true semblance of the warp and weft of fabric was eluding the artists. Their science backgrounds and love of the challenges of controlled trials proved invaluable to making them good fusers. Their determination to achieve a tight weave translated into innumerable experiments with firing schedules and kiln temperatures that yielded hundreds of pages of notes. "It took years to discover which kiln temperatures worked for which colors to get the same effect over the whole canvas of our sculptures," says Markow. "The end product is



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Two Markow & Norris originals—the *Desert Skull* wall sculpture and the *Spring to Autumn* table sculpture—are on display in a collector's home (above). Thom Norris (right) cleans a woven glass feather in the studio. One of the partners' newest pieces, *Hyacinth* (below) is a woven glass wall sculpture that measures 21 inches long.

not instantaneous; it takes a long time to get there. You can't just take a piece out of the kiln and let it cool. There's a whole process of how you apply the heat and of holding the piece at different temperatures. Everything has to be staged. This schedule didn't exist when we started weaving glass. We had to discover all those temperatures for ourselves.”

While glass producers make new colors occasionally they only do so in single colored sheets. On average only 50 base colors are available commercially. “Even the manufacturers are surprised by our color range,” says Norris. “They have never been

able to provide us with temperatures to support our color manipulations.”

Each Markow & Norris piece involves a six-week process that begins with the arrival of raw glass. New colors are tested for color compatibility—not all glass will actually stick together without cracking. Colors planned to be used together are then tested to determine the range of temperatures each requires. Decisions are made about layering glass to achieve a new



color, or adding pieces of other glass to give more texture.

Seeking a particular shade of chartreuse, for example, they may crush up some glass, add some opalescent glass and layer transparent glass on top. The glass is then cut into strips which are woven by hand. Each piece spends approximately 200 hours from start to finish coming in and out of the kiln.

In *Confetti*, one of the table sculptures weighing in at a hefty eight pounds and measuring 19 inches in diameter, the artists were striving for a broad range of color within the palette of the general colors red, blue, green, yellow and purple. Their process involved making and evaluating 20 or more hues of each shade to determine precisely the tones that would work together in transi-

tion in the piece. Within each color grouping multiple variations of the same color resonate, bringing heightened vibrancy and energy to each shade and to the sculpture itself.

Pieces like *Spring to Autumn* feature anywhere between 40 to 60 colors. Here the palette gradually transitions from the bright fresh greens of spring through the yellowing tones of summer to the burnt oranges of fall.

Given the time-consuming nature of their work, the artists produce only a limit-

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ed number of works per year. The wait to acquire a Markow & Norris sculpture is often up to four months. Pieces range in price from \$190 for the collectible nest babies to anywhere from \$1,960 to \$5,790 for large sculptures, all of which are limited editions with only 15 to 30 pieces made. Markow & Norris are represented in 29 galleries in 21 states, and in the gift shops of the Bellagio



The artists' new woven-glass nest babies, available in a multitude of colors, each coddle two tiny eggs made of cast glass. Pictured here are apple babies (right) and ice babies (left).

Hotel in Las Vegas and The Corning Glass Museum. Future plans include travel to New Zealand for an upcoming gallery show and authoring a book that will record the temperatures and formulations that would allow glass artists and manufacturers to expand their color range.

"Our work is time-consuming, but ultimately very simple," says Markow. "We're creating something, putting it together, putting it in the kiln. We never know exactly what's going to happen. And that's our ongoing process of discovery." For more information, contact Markow & Norris at (888)282-7081 or visit www.wovenglass.com ❖

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